

Patent Claims

1. A semiconductor component having the following features:

- a semiconductor body (20) with a substrate (22) of a first conduction type (p) and, situated above the latter, a first layer (24) of a second conduction type (n),

- a channel zone (50) of the first conduction type (p) formed in the first layer (24), with a first terminal zone (40; 40A, 40B, 40C, 40D) of the second conduction type (n) arranged adjacent to said channel zone,

- a second terminal zone (60) of the first conduction type (n) formed in the first layer (24) of the second conduction type,

- compensation zones (30,31) of the first conduction type (p) formed in the layer (24) of the second conduction type (n),

- a second layer (26) of the second conduction type (n) arranged between the substrate (22) and the compensation zones (30,31).

2. The semiconductor component as claimed in claim 1, in which, in the first layer (24), a boundary zone (80) of the first conduction type extends in the vertical direction of the semiconductor body (20).

3. The semiconductor component as claimed in claim 1 or 2, in which the boundary zone (80) reaches from the channel zone (50) as far as the substrate (22).

4. The semiconductor component as claimed in claim 1 or 2, in which the boundary zone (80) is arranged spaced apart from the

channel zone (50) in the lateral direction of the semiconductor body (20).

5. The semiconductor component as claimed in claim 4, in which the boundary zone (80) extends from a first surface of the semiconductor body (20) as far as the substrate (22).

6. The semiconductor component as claimed in one of the preceding claims, in which the compensation zones (30) are of pillar-shaped design.

7. The semiconductor component as claimed in claim 6, in which at least some of the compensation zones (30) adjoin the channel zone (50).

8. The semiconductor component as claimed in one of the preceding claims, in which the compensation zones (31) are of spherical design.

9. The semiconductor component as claimed in one of the preceding claims, in which second compensation zones (25) of the second conduction type (n) are formed in the first layer (24) adjacent to the compensation zones (30), the second compensation zones being doped more heavily than the second layer (24).

10. The semiconductor component as claimed in one of the preceding claims, in which the boundary zone (80) is doped more heavily than the substrate (22).

11. The semiconductor component as claimed in one of the preceding claims, in which the second terminal zone (60) has a section extending in the vertical direction of the semiconductor body (20) as far as the second layer (26) and a

section extending at the level of the second layer (24) in the lateral direction.

12. The semiconductor component as claimed in claim 11, in which the vertical section and the lateral section of the second terminal zone (60) enclose the first terminal zone (40; 40A, 40B, 40C, 40D) and at least some of the compensation zones (30) in a well-like manner.

13. The semiconductor component as claimed in one of the preceding claims, in which the number of dopant atoms of the first conduction type and the number of dopant atoms of the second conduction type in the first layer (24) are approximately identical.

14. A semiconductor component having the following features:

- a semiconductor body (20) with a substrate (22) of a first conduction type (p) and, situated above the latter, a first layer (24) of a second conduction type (n),

- a boundary zone (80) of the first conduction type (p) which runs in the vertical direction of the semiconductor body (20) and reaches as far as the substrate and a second layer of the second conduction type (n) which is formed between the layer (24) of the second conduction type (n) and the substrate and is doped more weakly than the first layer.